Transportation
Library
TA
1
A526

TRANSACTIONS

OF THE

AMERICAN SOCIETY

OF

CIVIL ENGINEERS.

(INSTITUTED 1852.)

VOL. XXVII.

JULY TO DECEMBER, 1892.

NEW YORK:
PUBLISHED BY THE SOCIETY.

1892.

Entered according to Act of Congress, by the AMERICAN SOCIETY OF CIVIL ENGINEERS, in the Office of the Librarian of Congress, at Washington.

NOTE.—This Society is not responsible, as a body, for the facts and opinions advanced in any of its publications.

CONTENTS.

PAPERS.

NO.	MONTH.		PAGE
535	(*July.*)	The Weehawken Elevators and Viaduct.	
		THOMAS E. BROWN, Jr., and GEO. H. BLAKELEY	1
536	(*do.*)	A Simple Method of Running in a Transition Curve.	
		JOHN F. WARD	18
537	(*do.*)	The Hydrography of the Potomac Basin.	
		CYRUS C. BABB	21
		Discussion on Paper No. 537.	
		By G. H. MENDELL	33
		H. F. DUNHAM	35
		F. H. NEWELL	35
		C. C. BABB	38
538	(*do.*)	Emergencies on Railroads.	
		CHANNING M. BOLTON	39
		Discussion on Paper No. 538.	
		By W. G. CURTIS	43
		SAMUEL M. ROWE	43
		C. PALMER	49
		BOLTON W. DE COURCY	52
		C. M. BOLTON	54
539	(*do.*)	Black Eagle Falls Dam, Great Falls, Montana.	
		M. S. PARKER	56
		Discussion on Paper 539.	
		By CYRUS C. BABB	67
540	(*do.*)	A New Formula for the Strength of Columns.	
		By A. J. DUBOIS	69
		Discussion on Paper No. 540.	
		By THOMAS H. JOHNSON	88
		HENRY B. SEAMAN	93
		A. J. DUBOIS	93
541	(*do.*)	Discussion on Paper No. 529. The Main Relief Sewer of Brooklyn.	
		By WILLARD BEAHAN	97
542	(*August.*)	Uniform Practice in Pile-Driving.	
		J. FOSTER CROWELL	99
543	(*do.*)	The Iron Wharf at Fort Monroe, Va.	
		JOHN B. DUNCKLEE	115
544	(*do.*)	Description and Methods of Construction of the Iron Coal Pier, Norfolk and Western Railroad at Lambert's Point, Va.	
		W. W. COE	125
		Discussion on Papers Nos. 542, 543, 544.	
		By A. M. WELLINGTON	129
		JNO. C. TRAUTWINE, Jr.	137
		J. FOSTER CROWELL	160
		CHARLES B. BRUSH	162
		G. BOUSCAREN	163
		C. W. DURHAM	164
		L. M. HAUPT	165
		WM. P. CRAIGHILL	165

NO.	MONTH.		PAGE
544	(*August.*)	Discussion on Papers Nos. 542, 543, 544—(*Continued*).	
		By W. M. BLACK	165
		CHARLES WARREN HUNT	167
		ROBERT B. STANTON	167
		HENRY B. SEAMAN	167
		WILLIAM WATSON	168
		FRANK W. SKINNER	168
		F. P. DAVIS	169
		BENJAMIN REECE	169
		G. B. NICHOLSON	170
545	(*do.*)	The Cantilever Highway Bridge at Cincinnati.	
		GUSTAVE KAUFMAN and F. C. OSBORN	173
546	(*September.*)	Wind Bracing in High Buildings.	
		HENRY H. QUIMBY	221
		Discussion on Paper No. 546.	
		By J. P. SNOW	228
		FOSTER MILLIKEN	229
		H. W. BRINCKERHOFF	232
		J. FOSTER CROWELL	234
		HENRY B. SEAMAN	235
		GEORGE A. JUST	236, 244
		A. F. SEARS	239
		L. L. BUCK	240
		F. COLLINGWOOD	240
		H. F. DUNHAM	241
		R. L. HARRIS	241
		JOHN BOGART	242
		MENDES COHEN	242
		HENRY H. QUIMBY	249
547	(*do.*)	Rainfall, Flow of Streams and Storage.	
		DESMOND FITZGERALD	253
		Discussion on Paper No. 547.	
		By JAMES B. FRANCIS	286
		A. FTELEY	286
		CLEMENS HERSCHEL	286
		FREDERIC P. STEARNS	288
		L. J. LE CONTE	292
		E. SHERMAN GOULD	293
		MANSFIELD MERRIMAN	295
		EDMUND B. WESTON	296
		B. W. DE COURCY	297
		LEWIS M. HAUPT	301
		B. M. HARROD	302
		DESMOND FITZGERALD	304
548	(*do.*)	Test of Power Required to Drive Electric Street Cars, and Total Efficiency of the Motor.	
		LOUIS B. BONNETT	307
549	(*do.*)	Motive Power for Street Railways.	
		ALFRED F. SEARS	313
550	(*do.*)	The Protection from Corrosion of Iron Work Used as Covering for Railroad Tunnels.	
		JAMES G. DAGRON	324
		Discussion on Paper No. 550.	
		By DESMOND FITZGERALD	329
		CHARLES MACDONALD	329
		CHAS. B. BRUSH	330
		J. P. FRIZELL	330

NO.	MONTH.		PAGE
551	(*September.*)	The Strength and Weathering Qualities of Roofing Slates.	
		MANSFIELD MERRIMAN	331
		Discussion on Paper No. 551.	
		By CHAS. B. BRUSH	348
		MANSFIELD MERRIMAN	349
552	(*October.*)	Hardening Structural Steel.	
		A. C. CUNNINGHAM	351
553	(*do.*)	The Results Obtained from Tests of Full-Sized Steel Eye Bars.	
		F. H. LEWIS	358
		Discussion on Papers Nos. 552 and 553.	
		By PERCIVAL ROBERTS, Jr	374
		A. GOTTLIEB	375
		JAMES G. DAGRON	376
		A. C. CUNNINGHAM	378
		WILLIAM METCALF	382
		JOHN W. LANGLEY	385
554	(*do.*)	Experiments on Iron and Steel Joints Riveted on Angle.	
		BERTRAM B. FLINT	406
555	(*do.*)	Hot Tests for Determining Change of Volume in Portland Cement.	
		W. W. MACLAY	412
		Discussion on Paper No. 555.	
		By R. W. LESLEY	425
		J. J. R. CROES	436
		ARTHUR MARICHAL	438
		E. SHERMAN GOULD	438
		S. BENT RUSSELL	441
		W. W. MACLAY	443
556	(*do.*)	A Method of Tunnel Alignment.	
		H. F. DUNHAM	453
		Discussion on Paper No. 556.	
		By ROBERT B. STANTON	457
		O. F. NICHOLS	458
		J. F. O'ROURKE	459
		J. FOSTER CROWELL	460
		A. McC. PARKER	461
		C. L. CRANDALL	463
		H. F. DUNHAM	464
557	(*do.*)	Combination Bridge Building on the Pacific Coast.	
		ALFRED D. OTTEWELL	466
558	(*do.*)	Some Notes on Foundation Experiences.	
		A. P. BOLLER	471
559	(*November.*)	Thin Floors for Bridges.	
		ALBERT F. ROBINSON	483
		Discussion on Paper No. 559.	
		By GEORGE S. MORISON	500
		T. C. CLARKE	501
		G. LEVERICH	502
		C. P. SNOW	503
		GEORGE H. THOMSON	506
560	(*do.*)	Railway Signaling as Applied to Large Installations.	
		JOHN P. O'DONNELL	515
561	(*do.*)	Electric Rock Blasting—The American Method.	
		WILLIAM L. SAUNDERS	530
562	(*do.*)	Construction of a Cheap Dam across the Roanoke River, near Salem, Va.	
		OSCAR SAABYE	565

NO.	MONTH.		PAGE
563	(*November.*)	Motive Power for Street Railways.	
		Discussion on Paper No. 549.	
		By E. N. KIRK TALCOTT	574
		H. W. BRINCKERHOFF	575
		ROBERT L. HARRIS	576
		ARTHUR P. DODGE	578
		CHARLES E. EMERY	581
		W. H. BREITHAUPT	582
		ALFRED F. SEARS	583
		E. E. RUSSELL TRATMAN	583
564	(*do.*)	Pile-Driving—Discussion on, Paper No. 542.	
		By GEORGE B. FRANCIS	589
		J. FOSTER CROWELL	593
565	(*December.*)	The Controverted Questions in Road Construction.	
		JAMES OWEN	603
		Discussion on Paper No. 565.	
		By E. P. NORTH	623
		C. B. BRUSH	626
		G. W. HOWELL	627
		F. COLLINGWOOD	627
		JAMES OWEN	625
566	(*do.*)	Use of Asphaltum for Reservoir Linings.	
		JAMES D. SCHUYLER	630
567	(*do.*)	The Increasing Cost of Railway Tie Renewals.	
		BENJAMIN REECE	641
		Discussion on Paper No. 567.	
		By MENDES COHEN	649
		RICHARD MONTFORT	650
		BENJAMIN REECE	653
568	(*do.*)	The Shone Hydro-Pneumatic System of Sewerage.	
		URBAN H. BROUGHTON, Esq	659
569	(*do.*)	Discussion on Paper No. 548.	
		Test of Power Required to Drive Electric Street Cars, etc.	
		By C. B. BRUSH	675
		C. E. EMERY	676, 677
		A. F. SEARS	676
		L. B. BONNETT	675, 676, 677
570	(*do.*)	Discussion on Paper No. 559.	
		Thin Floors for Bridges.	
		By A. F. ROBINSON	680
571	(*do.*)	Discussion on Paper No. 551.	
		The Strength and Weathering Qualities of Roofing Slates.	
		By GEO. P. MERRILL and EDWARD H. WILLIAMS, Jr.	685, 687

ILLUSTRATIONS.

PLATE.	MONTH.		PAPER	PAGE
I-II.	(*July.*)	General Elevation and Views	535	2
III.	(*do.*)	Foundation Plan of Tower	535	4
IV-V.	(*do.*)	Sections of Tower	535	5
VI.	(*do.*)	Details of Tower Spans	535	7
VII.	(*do.*)	Elevators and Towers	535	12
VIII.	(*do.*)	Hydraulic Elevator Cylinders	535	12
IX.	(*do.*)	Safety Apparatus	535	14

PLATE.	MONTH.		PAPER	PAGE
X.	(*July.*)	Traveling Sheaves	535	15
XI.	(*do.*)	Operating Apparatus	535	15
XII.	(*do.*)	Diagram of Discharge of the Potomac River	537	25
XIII.	(*do.*)	Daily Rainfall of the Potomac Basin	537	28
XIV.	(*do*)	Plan of Black Eagle Falls Dam	539	60
XV-XXI.	(*do.*)	Details and Views of Dam in Process of Construction	539	63
XXII.	(*do.*)	Formulas and Experimental Curves.—Strength of Columns	540	78
XXIII.	(*August.*)	Details of Iron Disc and Screw Piles and Construction	543	117
XXIV-XXV.	(*do.*)	Sections and Part Elevation of Iron Coal Pier	544	128
XXVI.	(*do.*)	View of Iron Coal Pier	544	128
XXVII-XXVIII.	(*do.*)	Elevation, Plan, View	545	174
XXIX.	(*do.*)	Hydrography of the Ohio River	545	178
XXX.	(*do.*)	Details of Caisson	545	184
XXXI.	(*do.*)	Anchor Arm of Cantilever—Cincinnati Side	545	192
XXXII-XXXIX.	(*do.*)	Details of Trusses	545	194
XL-XLIII.	(*do.*)	Views	545	194
XLIV.	(*September.*)	Improved Column Connection	546	230
XLV.	(*do.*)	Topographical Map of Sudbury Drainage Basin	547	257
XLVI.	(*do.*)	Storage Diagram	547	265
XLVII.	(*do.*)	View of Albion Slate Quarry	551	334
XLVIII.	(*do.*)	" Old Bangor Slate Quarry	551	334
XLIX.	(*do.*)	Slate Banks at Pen Argyle	551	334
L.	(*October.*)	Photograph of Steel Fractures	552	357
LI.	(*do*)	Details of Apparatus for Hot Testing of Cements	555	425
LII.	(*do.*)	Roseburgh Cantilever Bridge—General View	557	470
LIII.	(*do.*)	" " Driving the Last Spike	557	470
LIV.	(*do.*)	Hilltown Bridge—General View	557	470
LV.	(*do.*)	Roseburgh Cantilever Bridge—Strain Sheet	557	470
LVI.	(*do.*)	" " " Detail of Shore Arm.	557	470
LVII.	(*do.*)	" " " Detail of River Arm.	557	470
LVIII.	(*do.*)	" " " Detail of Panel Points	557	470
LIX.	(*do.*)	" " " Detail of Shore Piers	557	470
LX.	(*do.*)	Hilltown Bridge—Detail—34-Pile Pier	557	470
LXI.	(*November.*)	General Elevation of a 150-ft. Span	559	486
LXII.	(*do.*)	Stringers, Pedestals, Bed Plates, etc	559	486
LXIII.	(*do.*)	Box Floor Complete for Full Span	559	486
LXIV.	(*do.*)	Forty-eight ft. through Flat Girder Span, with Floor, etc	559	486
LXV.	(*December.*)	Slope Roller for Reservoir Banks	566	633
LXVI.	(*do.*)	West Bank of West Reservoir	566	634
LXVII.	(*do.*)	East Bank of West Reservoir	566	634

A complete index of Volume XXVII of *Transactions*, July to December, 1892, and to *Proceedings*, Volume XVIII, 1892, will be published soon.